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ABSTRACT

This report focuses on practices related to the selection and presentation of commercially available electronic resources. As part of the Digital Library Federation's Collection Practices Initiative, the report also shares the goal of identifying and propagating practices that support the growth of sustainable and scalable collections. It looks in depth at how a number of leading research libraries select, license, present, and support the use of commercial online materials. Uncovering a variety of practices, the author is careful to identify those that converge and illuminate the most effective means for integrating commercial online materials into library collections. The main body of the report discusses 10 issues and practices related to selection and presentation. The first issue is the economic context of electronic resource selection. Discussion of this topic focuses on the two most visible means libraries have developed for dealing with the pricing of electronic resources: consortial purchasing and alternative scholarly communication initiatives. The next two sections cover selection policies and strategic plans, and organizational matters. The remaining sections deal more directly with operational questions and are organized roughly in a "resource life cycle" sequence. The discussion starts with initial selection issues and proceeds through ordering and purchasing, establishing and organizing access, providing support, and evaluating and assessing how information is used. The report concludes with a discussion of some local databases and systems devised to support or help rationalize the treatment of electronic resources. The most promising selection and presentation practices are assembled and briefly discussed in the concluding section. Many local practice documents and related Web links are cited throughout the report; these references, as well as additional relevant documents and Web links, are organized into a table in Appendix A. Appendix B provides a table of function and data elements for managing electronic resources. (Contains 130 references.) (AEF)

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Selection and Presentation of Commercially Available Electronic Resources: Issues and Practices

by Timothy D. Jewell

July 2001

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About the Author

Tim Jewell became head of collection management services at the University of Washington in 1998. He has been involved in the coordination of electronic resources there since 1992, when he was appointed head of the UW Libraries' Electronic Information Program. He has been active in regional consortium activities for several years and served as visiting program officer for electronic resources at the Association of Research Libraries from 1996 to 1998. He received a master's degree in library science from SUNY-Albany, and a master's degree in sociology from the Pennsylvania State University. He recently published an article on "Library Resources and Services for Sociology" in the second edition of the *Encyclopedia of Sociology*.

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Preface

In January 2000, the Digital Library Federation (DLF) launched an informal survey to identify the major challenges confronting research libraries that use information technologies to fulfill their curatorial, scholarly, and cultural missions. With astonishing unanimity of opinion and clarity of voice, respondents pointed to digital collection development as their single greatest challenge. Whether the digital information came from a commercial publisher or from a digitization unit within the library, it seemed to exist under a cloud of profound and unsettling uncertainty. Would it be useful and useable in its present or intended form, or require additional work by catalogers, systems staff, or subject bibliographers? What new demands would its availability make on library reference staff? What level of continued investment would be necessary to ensure its accessibility on current hardware and software?

The survey also revealed that leading research libraries had learned a great deal about their digital collections through experience. Though substantial, that learning had rarely been expressed outside the collection policies, working papers, and implementation guidelines that libraries create to coordinate and manage their collection development efforts. Accordingly, in April 2000, the DLF commissioned three reports to address broader concerns about digital collections. The three reports deal respectively with commercial electronic content, digital materials created from library holdings, and Web-based "gateways" that link to selected Internet resources in the public domain. The reports mark a starting point for what we hope will emerge as an evolving publication series.

Working to a common outline and based on the lessons of experience, the authors demonstrate how decisions taken by a library when acquiring (or creating) electronic information influence how, at what cost, and by whom the information will be used, maintained, and supported. By assembling and reviewing current practice, the reports aim where possible to document effective practices. In most cases, they are able at least to articulate the strategic questions that libraries will want to address when planning their digital collections.

Tim Jewell looks in depth at how a number of leading research libraries select, license, present, and support the use of commercial online materials. Uncovering a variety of practices, he is careful to identify those that converge and illuminate the most effective means for integrating commercial online materials sustainably into library collections. Since the cost of commercial content is a major concern to both libraries and publishers, the report begins there. It critically assesses the licensing options that are available to libraries, individually and consortially, and some of the emerging strategies that libraries are using to contain costs. Subsequent sections deal with operational chal-

lenges and follow the commercial resource's "life-cycle" from ordering and purchasing to cataloging, Web presentation, user support, use assessment, and preservation. The report concludes with a table that summarizes the most effective practices that are uncovered.

The author does not set out to provide a recipe for sustainability so much as a commentary on the important issues that libraries must address as they increase their investments in commercial online materials. In effect, he gives us a decision tool that emphasizes and supports strategic planning, and encourages careful consideration of how libraries' functions and professional staff are organized. He also supplies an essential reference tool, citing working papers and operational guidelines that libraries rely on but rarely "publish." Finally, he frames an important and practical development agenda by encouraging libraries to collaborate in designing information systems capable of organizing the detailed and often dynamic information they need to maintain about their commercial holdings.

Daniel Greenstein
Director, Digital Library Federation

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1. INTRODUCTION

Over the last decade, libraries of all kinds have been spending larger and larger shares of their budgets to acquire or gain access to electronic resources from publishers and vendors. Ten years ago, the user of a typical Association of Research Libraries (ARL) library would have found little more than a handful of the more prominent periodical indexes and abstracts—possibly in CD-ROM format. Today, that user would find a daunting array of resources that might include hundreds of databases and thousands of electronic journals.

Electronic resources have enabled libraries to improve services in a variety of ways. First, most electronic resources come equipped with powerful search-and-retrieval tools that allow users to perform literature searches more efficiently and effectively than was previously possible. In addition, because most relevant electronic resources are now available through the Web, users can have desktop access to them 24 hours a day. In many cases, users also can now navigate directly from indexing databases to the full text of an article and can even follow further links from there.

Most users have welcomed these developments. Nevertheless, libraries face a number of technical, financial, and organizational challenges as they seek to continue offering the high level of services that users have come to expect. The purpose of this report is to review some of the key issues facing libraries and to describe some of the more promising practices that libraries have devised—individually and collectively—to deal with them.

1.1. Scope and Perspectives

This report focuses on practices related to the selection and presentation of commercially available electronic resources. As part of the Digital Library Federation's Collection Practices Initiative, the report also shares the goal of identifying and propagating practices that support the growth of sustainable and scalable collections. To give readers a common reference, this section begins with a brief discussion of key terminology.

In an attempt to be as inclusive as possible, the term "commercially available resources" is defined as virtually any electronic product or service for which libraries spend funds. The breadth of this definition is suggested by some of the types of electronic reference resources enumerated by Demas, McDonald, and Lawrence (1995) and Kovacs (2000a; 2000b), directories, dictionaries, abstracts, services providing indexes and tables of contents, encyclopedias and almanacs, e-serials, bibliographies and bibliographic databases, and "key primary documents." The topic of electronic serials is itself quite complex, as indicated by some recent overviews (Barber 2000; Curtis, Scheschy, and Tarango 2000). To this basic inventory of types must now be added a few new genres, such as historical full-text collections and electronic books.

It is also necessary to briefly consider the conditions that might enable commercially available collections or resources to be "sustainable." Librarians today tend to characterize pricing models, or the information marketplace in general, as sustainable or not, and this is the sense in which the word has been used recently in some influential documents. For example, a document issued in 1998 by the International Coalition of Library Consortia (ICOLC) states that "current pricing models for e-information, which are developing during a period of experimentation, are not sustainable" (ICOLC 1998a). Another document, "Principles for Emerging Systems of Scholarly Publishing," employs the word somewhat similarly, but it also declares that the current system of scholarly publishing and communication "has become too costly for the academic community to sustain" (Principles 2000). Vendors and providers of electronic resources also need to be concerned about the economic sustainability or viability of their products, and their views of what may be required for sustainability may conflict with what libraries view as the realities of their funding situations.

Because pricing issues are fundamental to sustainability, this report examines some emerging strategies for exerting economic pressure within the marketplace for electronic resources. However, because substantial staff time may be necessary to acquire and provide access to databases and e-journals, sustainability is also an operational question. With that in mind, this report also focuses on operational and organizational issues and practices. Nevertheless, it is important to recognize the influence that vendor design and presentation choices have on the amount and kind of time and effort required of libraries. Libraries and vendors alike have important roles to play in fostering an environment in which resources and services are sustainable for both communities.

These broad definitions of commercially available resources and of sustainability affected the scope of this study. Most important, they limited the number of libraries whose internal policies and practices could be surveyed and the way in which the survey could be done. Because problems of scale, or size of collection, are among the central concerns of this report series, it made sense to focus on libraries that have relatively large collections of commercially avail-

able electronic resources. The member libraries of the Digital Library Federation (DLF) generally fit that description, and they number fewer than 30. Because it was possible to communicate with them relatively easily, they also provided a convenient sample on which to focus. Attempts were made to look beyond the DLF libraries when trying to identify useful practices.

1.2. Methodology, Aims, and Organization

The foregoing considerations formed the starting point for an extensive review of internal documents and local practices that started with the two recent and useful ARL SPEC Kits on managing the licensing of electronic products (Soete and Davis 1999) and on networked information resources (Bleiler and Plum 1999). The documents reproduced in these publications often pointed the way to additional documents and discoveries or led to telephone conversations and e-mail messages with librarians involved in the practices discussed or depicted. The public Web sites of DLF member libraries and several other ARL libraries with large collections of electronic resources were also reviewed. This led to further contacts and conversations, to discovery of additional internal documents, and to the generation of still more ideas.

The main body of this report discusses 10 issues and practices related to selection and presentation. The first issue is the economic context of electronic resource selection. The discussion of this topic describes the two most visible means libraries have developed for dealing with the pricing of electronic resources: consortial purchasing and alternative scholarly communication initiatives. The next two sections cover selection policies and strategic plans, and organizational matters. The remaining sections deal more directly with operational questions and are organized roughly in a "resource life cycle" sequence. The discussion starts with initial selection issues and proceeds through ordering and purchasing, establishing and organizing access, providing support, and evaluating and assessing how information is used. The report concludes with a discussion of some local databases and systems devised to support or help rationalize the treatment of electronic resources. It is hoped that this information will help DLF libraries and others define standard functions and data elements, and otherwise collaborate in developing improved systems for supporting the acquisition and maintenance of licensed electronic resources.

The most promising selection and presentation practices are assembled and briefly discussed in the concluding section. Given the dynamic nature of electronic resources, many of these practices may soon be outdated. Accordingly, the goal is to assist in local decision making, rather than to establish a set of formal standards. Many local practice documents and related Web links are cited throughout the report; these references, as well as additional relevant documents and Web links, have also been organized into a table in Appendix A.

2. Selection Issues and Practices

2.1. The Economic Context of Electronic Resource Selection

ARL and DLF libraries have gradually increased the amount of money spent for electronic resources over the last decade or so, and they are spending an increasing proportion of their budgets on such resources (Kyrillidou 2000, Jewell 1998). In each of the last five or six years, the percentage of their resource budgets that these libraries earmarked for electronic resources has grown by about 1 percent, and in 1998–1999, both ARL and DLF member libraries spent about 10 percent of their resource budgets on electronic resources. More than 85 percent of such expenditures were for serials and represented ongoing commitments. If prices for electronic resources rise as rapidly as have serial prices in general, the shift in spending could lead to additional financial pressures for libraries. The apparent need to maintain print copies of electronic resources while electronic archiving agreements and technology are developed will add further pressures.

There is good reason to predict that e-resource expenditures will accelerate rapidly over the next few years. For example, more and more journals from established publishers are becoming available on the Web, and tens of thousands of electronic books are now available through a single new company: netLibrary. Questia, another new company, has begun to offer an extensive collection of electronic resources directly to users. Although it is too early to tell whether such new services will take hold, there is substantial concern in some libraries that they must respond to this competition if they are to remain important sources of information on their campuses. For these libraries, one response to this new "competitive space" (Hughes 2000) will be to invest more heavily in electronic resources.

As libraries spend more money acquiring electronic resources or access to them, there are growing concerns over the interrelated problems of vendor pricing and institutional finances. In particular, there is a common perception that libraries are at a disadvantage when acting alone in this environment and that collaborative effort is necessary. This is perceived to be especially true when libraries negotiate with large corporate entities. Two important and fairly distinct types of collaboration have begun to shape the electronic resource market. The first of these is cooperative purchasing through library consortia, and the second is the development of alternative outlets for scholarly communication. The ultimate impact of each of these developments on prices and the marketplace remain to be seen.

2.1.1. Consortial Purchasing and Pricing

The importance of consortia and consortial buying has become obvious to librarians around the world who are involved in acquiring electronic resources. Consortia have been formed for a variety of reasons and exhibit a number of similarities and differences. Some of

them, such as OhioLINK, VIVA, and the California Digital Library (CDL), are state-based and limited to academic libraries. Other academic library consortia, such as the Committee on Institutional Cooperation, include members in multiple states within a region. The NorthEast Research Library (NERL) consortium also includes members from several states, but its members are primarily private universities. There are also many state-based multitype consortia, such as NC Live in North Carolina and INCOLSA in Indiana, as well as national consortia based in the United Kingdom, Canada, Australia, and elsewhere. Some of these consortia originated with broad mandates to foster resource sharing through online catalogs; they are relevant to this report to the extent that they attempt to negotiate better prices and other terms for libraries that are purchasing electronic resources.

Consortial arrangements for databases can benefit libraries financially in various ways. Usually, as the buying group expands, prices are lowered. One common practice is to put in place a price per full-time equivalent (FTE) student that is based on a sliding scale; as more FTE students are added to the consortial contract, the price is lowered. Another approach, taken by journal publishers, is to determine the scope and content of a consortial e-journal collection on the basis of library holdings within the consortium. Examples of this include the arrangements that OhioLINK and NERL have with Elsevier under which members have access to all ScienceDirect titles. Since no individual library is likely to be able to subscribe to all of this publisher's titles on its own, even the best funded of them stand to gain access to considerable content under such arrangements. Smaller libraries may be able to dramatically improve access to resources for relatively small amounts of money. Sanville (2000) has shown that this content is likely to be used when made available, and has called into question the traditional assumptions on which librarians have made local journal selection decisions.

Consortial purchasing also must be profitable for publishers and vendors, and many of them see these arrangements as opportunities to reduce marketing and invoicing costs. It has been argued that consortial contracts for e-journal packages enable publishers to gain revenue from smaller institutions that could not otherwise afford to subscribe to any of these journals.

Although consortial arrangements can provide libraries with much better pricing or other advantages, those benefits must be weighed against the costs of doing business consortially, which can include substantial staff time and some losses of local control and flexibility. An added complication is that libraries can be formal or informal members of a number of different, and sometimes competing or overlapping, consortia and buying groups. Deciding which arrangements make the most sense in a given situation may be difficult.

An examination of public consortia member lists and other sources reveals that most DLF libraries are members of multiple consortia. As shown in Table 1, they are most likely to be members of a

regional consortium such as the Center for Institutional Cooperation (CIC), NERL, Association of Southeastern Research Libraries (ASERL), or the Big 12 Plus. Most also belong to at least one major state-based consortium. For example, Penn State is a member of the regional CIC and two state-based groups: PALCI and PALINET. As noted, many group-buying arrangements seem to be ad hoc and difficult to identify. Consequently, it seems likely that the typical DLF library (and by extension, ARL library) will be involved in many collaborative buying arrangements with varying degrees of formalization.

DLF Member Institution	Regional Consortia	State Consortia
California, Berkeley		CDL
Carnegie-Mellon	NERL (affiliate)	PALCI; PALINET
Chicago	CIC	
Columbia	NERL	
Cornell	NERL	
Emory	ASERL	GALILEO
Harvard	NERL	
Illinois, Urbana	CIC	ILLINET; IDAL; ILCSO; ICCMP
Indiana	CIC	INCOLSA
Library of Congress		
Michigan	CIC	Michigan Library Consortium
Minnesota	CIC	MINITEX
New York Public Library		
North Carolina State	ASERL	NCLive; TRLN
Penn State	CIC	PALCI; PALINET
Pennsylvania	NERL	PALCI
Princeton	NERL	
Southern California	Big 12 Plus	SCELC
Tennessee	ASERL	
Texas	Big 12 Plus	TexShare
Virginia	ASERL	VIVA
Washington	Big 12 Plus	Washington Cooperative Library Project
Yale	NERL, NELINET	

ASERL = Association of Southeastern Research Libraries
CDL = California Digital Library
CIC = Center for Institutional Cooperation
IDAL = Illinois Digital Academic Library
ICCMP = Illinois Cooperative Collection Management Program
ILCSO = Illinois Library Computer Systems Office
NERL = NorthEast Research Libraries consortium
PALCI = Pennsylvania Academic Library Consortium, Inc.
SCELC = Statewide California Electronic Library Consortium
TRLN = Triangle Research Libraries Network

Table 1. DLF Member Libraries' Consortial Memberships

This study attempted to discern the extent to which these libraries are currently purchasing selected databases and e-journal access through consortia by checking the Web sites of member libraries for a limited number of expensive "big-ticket" databases and selected e-journal packages. Appropriate consortia Web sites were then checked to determine whether there seemed to be a consortial role, and further contact was made with a few key individuals to double-check the information.

Several of the databases selected for this review are prominent general-interest and business-related full-text aggregator services, such as Academic Universe from Lexis-Nexis; EBSCO's, Gale's, and Bell & Howell's primary academic and business databases; and H. W. Wilson Company's "Wilson Select" and Omni products. To help reflect buying patterns in scientific, technical, and medical (STM) fields, Chemical Abstracts Services' (CAS) Scifinder Scholar and the Institute for Scientific Information's (ISI's) Web of Science products were chosen. Holdings of significant full-text databases in the humanities from Chadwyck-Healey and participation in the Early English Books Online (EEBO) project were also reviewed.

Of the full-text aggregator databases selected for this review, the most widely held among DLF libraries is Academic Universe, to which all the academic members currently subscribe. This may not be surprising, since more than six million FTE students across the country have access to it through a national consortial arrangement brokered by SOLINET. The popularity of this service among academic libraries of all sizes is probably due in part to the vendor's adoption of the sliding-scale fee structure described earlier. The situation with the other competing full-text aggregator databases offered by EBSCO, Gale, Proquest/Bell & Howell, and H. W. Wilson Company is much less clear. The Proquest ABI/INFORM and Research Library databases are the most commonly held of these services (about half of the libraries subscribe to one or both of them), but consortial arrangements seemed to be involved in only a quarter (or fewer) of those cases. Gale's Expanded Academic Index and Business databases are also relatively popular, but consortial buying appeared to be involved in only four cases. EBSCO's general academic and business databases were somewhat less popular, but statewide contracts appear to be the major factor where they were available. H. W. Wilson's databases appear rarely to be purchased by DLF libraries through consortia.

Among DLF libraries, ISI's Web of Science is almost as popular as is Academic Universe; 21 of the 22 academic DLF member libraries offer it. Roughly 80 percent of the subscribing libraries were purchasing it through consortia (primarily through the CIC or NERL). Eight of the nine DLF libraries having access to Scifinder Scholar subscribe through consortia, but six of those eight institutions were buying through NERL. Fourteen DLF libraries provide significant full-text databases from Chadwyck-Healey. Six of these libraries were buying through NERL. Seven libraries, five of which are NERL members, subscribe to EEBO. Consortial arrangements appear to be

important factors in buying most of these databases, with the apparent exception of full-text aggregator databases.

To gain a sense of the role of consortia in the selection of electronic journals by DLF member libraries, a list of more than 20 prominent e-journal publishers and vendors was assembled. The for-profit publishers selected were Academic Press, Annual Reviews, Blackwell Science/Munksgaard, Elsevier, Kluwer, MCB Universities Press, Springer, and Wiley. The following university presses or university-based publishers or providers were included: Cambridge University Press, Oxford University Press, Project Muse, and HighWire. In addition, a number of association publishers were included, such as the Association for Computing Machinery (ACM), the American Chemical Society (ACS), the American Mathematical Society, the Institute of Electrical and Electronic Engineers, the Royal Society of Chemistry, and the Society for Industrial and Applied Mathematics (SIAM). The two first JSTOR collections (Arts and Sciences I and General Sciences) were also included, although they do not provide the current journal access that the other publishers do.

To determine which DLF libraries had online access to journals from these publishers and providers, their gateway e-journal lists and online catalogs were searched. Publisher and consortia Web pages were also examined to see which DLF-relevant consortia might have signed agreements with which publishers. Because of the prominence of its Electronic Journal Center, OhioLINK was included in the study and was contacted for a current list of e-journal packages available to its members. It was decided to consider only the access that was available at the end of December 2000.

A few tentative conclusions may be drawn from this investigation. First, many of the listed publishers were offering individual libraries "free electronic access with print subscriptions" at the time of study. Most DLF libraries had taken advantage of those offers and were providing their users with such access. Second, consortial arrangements appeared to be somewhat less common and important for the not-for-profit publishers than the for-profit group.

To illustrate, almost all DLF libraries provided access to the two JSTOR collections, but largely because JSTOR does not provide special consortial pricing, only three libraries subscribed via consortia. Other publishers with relatively high rates of subscription (i.e., 60 percent or more) but low rates of consortial adoption (i.e., four libraries or fewer) were ACM, the American Institute of Physics, SIAM, and Oxford University Press. The publishers showing similar rates of subscription, but higher rates of consortial adoption (i.e., six or more libraries), included two not-for-profits (Project Muse and ACS) and a number of for-profit publishers (Academic Press Ideal, Annual Reviews, Elsevier, Springer, and Wiley). Fewer than half of these libraries appeared to have online access to journals from two other for-profit publishers (Kluwer and Blackwell Science); however, consortial arrangements were generally found to exist for the Kluwer subscribers, and almost always for Blackwell Science.

2.1.2. Scholarly Communication Reform Initiatives

Although the consortial movement appears to have had a significant effect on prices, the recent development of Web-based alternative outlets for scholarly communication may also influence the market for scholarly information. One of the earliest and most successful of these alternatives is the physics preprint server at the Los Alamos National Laboratories, now known as arXiv, which is provided free of charge and serves researchers in a wide variety of physical science disciplines (Los Alamos National Laboratories 2000). Within a relatively short time, it has become an important part of the research culture in several of these disciplines. For example, a recent study of the 20 most cited sources in Chemical Abstracts revealed that the fourth, eighth, and sixteenth most-cited sources are, respectively, the arXiv preprint archives for *High Energy Physics, Condensed Matter, and Astrophysics* (Roth 2001). The success of this initiative has inspired other efforts, such as those of Pubmed Central and the Public Library of Science, to make research articles available free via the Web.

The ARL has organized several initiatives aimed at addressing the problem of high journal prices. Most recently, these efforts have focused on three complementary programs. The first of these is the Scholarly Publishing and Resources Coalition (SPARC), which has helped fund the development of a number of electronically based scientific journals and resources (Case 2001; Michalak 2000; Stoffle 2001). One of SPARC's main goals is to foster competition in the STM journal market; consequently, some SPARC journals have been developed to compete directly with specific journals deemed to have especially high prices. SPARC's related Create Change and Declaring Independence initiatives are aimed at raising journal editors' awareness of pricing issues and at encouraging them to take remedial actions to restrain prices. Suggested strategies include negotiating with publishers about pricing policies or, if pricing negotiations are unsuccessful, starting competing journals.

Some of these efforts have been successful. For example, the American Association of Physical Anthropologists has reported that the publisher of its journal agreed to significantly reduce its subscription price after lengthy discussions and negotiations (Albanese 2000). The SPARC initiative appears to be well received among ARL members, and most DLF member libraries have supported it by becoming founding members or initiating SPARC-affiliated projects (e.g., Columbia's Earthscape, Cornell's Project Euclid, and CDL's e-scholarship initiative). Nevertheless, the program is not free of controversy. For instance, librarians sometimes complain that faculty may not accept the cancellation of established but expensive titles or the packages that include them and that funds must therefore now be found both to pay for the SPARC titles and to continue the established titles.

Although libraries seem to have good reason to support both the consortial and scholarly communication reform movements, a number of recent articles have pointed to a tension between the two approaches. For example, Landesman and Van Reenen (2000) have pos-

ited that there is a natural affinity or congruence between consortia and large publishers or vendors. Both are looking for the economies of scale that are represented by large packages, and although these packages typically do provide subscribers with more content for their money than individual print subscriptions used to, the large dollar commitments required can quickly claim larger and larger shares of scarce resources. These commitments will appear more justified as usage climbs because of visibility and easy availability. When that happens, there will be less money to pay for the individual titles and smaller packages that consortia are poorly equipped or unprepared to handle; these will tend to be the more modestly priced offerings from the scholarly associations and university presses. In a similar vein, Frazier (2001) has warned of the dangers of the "big deal"—high-cost packages of e-journals from for-profit publishers. In response, supporters of such package deals have emphasized the added content that may be made available and the importance of user choice. They have also stated that libraries do not surrender their ability to negotiate terms when they enter such agreements (OhioLINK 2001; Mulliner 2001).

There seems to be much value in both the consortial and "reform" approaches to influencing the market, and thoughtful people might reasonably lean in one or the other direction. However, as Landesman and Van Reenen (2000) suggest, consortia could help ensure the success of SPARC-like initiatives if those initiatives could be made more "consortia friendly." Bundling significant amounts of content, as the SPARC BioOne initiative is doing, seems to be one way to address the need for economies of scale. As noted earlier, some for-profit publishers have also found that consortial contracts can provide them with new income from smaller institutions if the contracts provide those institutions with substantial content for little money. In addition to supporting these institutions financially, consortia could facilitate faculty education efforts and help create alternatives to established publishing outlets.

2.2. Selection Policies and Strategic Plans

Faced with high user expectations, rapid change, and competitive pressures, it is not surprising that many librarians characterize local selection decisions as ad hoc or opportunity driven. Such decisions are also sometimes described as having strong political elements; this may be especially apt when the purchase of one expensive service for a particular group rules out the acquisition of another service that a different constituency may feel it needs.

Many libraries have tried to overcome such tendencies and perceptions and to give shape to their licensed digital collections by writing and adopting formalized local policies and plans. It seems clear that such documents should reflect and support the differing missions of these libraries and their parent institutions, and several do, although sometimes in only in a general way. For instance, Massachusetts Institute of Technology's (MIT's) document, entitled "To-

ward a Networked Resources Policy," begins by noting that the library "seeks to acquire access to the primary digital information resources which support the educational and research missions of the Institute" (MIT 1997). A similar statement appears in the University of Southern California's (USC's) Collection Policy Statement for Information in Electronic Formats (University of Southern California, undated).

A general sense of institutional mission may or may not prove helpful in making real-life decisions. Libraries that are funded to serve broader state, regional, or national constituencies face special dilemmas in the digital environment. For example, the Library of Congress has traditionally served an archival function for printed materials, and that will be more difficult when these materials are both digital and licensed (National Research Council 2000). Similarly, the libraries of large, state-funded universities are often expected to share their resources with other libraries or individuals in their states. When subscriptions to scholarly e-journals come with significant license-based restrictions or prohibitions on use for interlibrary loan, the institution can find itself caught in a new way between the priorities of local users and other groups.

2.2.1. Selection Policies

Perhaps the most common thread running through the selection policy documents sampled for this project is that although electronic resources raise new questions, the value system brought to bear on selecting more traditional resources is still valid. That idea was promulgated several years ago in Demas's (1994; Demas, McDonald, and Lawrence 1995) descriptions of efforts to "mainstream" selection of electronic resources at Cornell. It is also expressed in policy documents used at Penn State University (2000), the California Digital Library (1997), and the Library of Congress (1999). The University of Texas's General Libraries Digital Collection Development Framework elaborates on this notion, noting that, "as with all formats, digital material should meet the same subject, chronological, geographical, language and other guidelines as outlined in the library's subject collection policies; and possess the same standards of excellence, comprehensiveness, and authority that the library expects from all of its acquisitions" (University of Texas 1999).

It may be difficult to translate such general considerations—well stated as they may be—directly into decision making. Several selection-policy documents also refer to the need to support programs or to define the constituency to be served by a given resource. The documents mention other interesting considerations, including the need to maintain a balance among disciplines or subject areas, or with traditional formats, when choosing electronic resources. Some policies stipulate that there need to be identifiable and strong reasons for selecting electronic access over print or other formats. The CDL's Collection Framework document points to six pertinent factors, among which are the potential added values of greater timeliness, more ex-

tensive content, and greater functionality or access (California Digital Library 1997).

Selection guidelines also typically discuss factors unique to electronic resources. In some cases, these are presented in checklist form, but the Database Selection Criteria in use by the CDL (California Digital Library 1999b, 2000d) incorporate an interesting refinement to this approach by differentiating between the non-content factors deemed "critical" and those viewed only as "important." Yale's Examining Networked Resources checklists (Yale 1998) are unusually thorough, but have much in common with those used elsewhere. The following list of topical categories is based largely on Yale's lists:

- *Content:* Comparisons with printed versions in terms of such considerations as completeness versus selectivity, back-file coverage, and update frequency
- *Added Value:* Wider access, searchability, potentially greater currency
- *Presentation or Functionality:* Usability, searching and limit functions, linking
- *Technical Considerations:* Hardware and software requirements, including storage space, Web browser compatibility, plug-in requirements, and authentication
- *Licensing and Business Arrangements:* Problematic license restrictions, ongoing access rights, costs
- *Service Impact:* Documentation, publicity, staff training needs

2.2.2. Strategic Plans

Many institutions are beginning to consider project-selection decisions more carefully and to strategize about the acquisition of different types of resources. For example, the University of Texas "framework" document incorporates strategic considerations in a section on Observations and Qualifications that concerns different categories of resources, such as electronic journals and indexing and abstracting databases (University of Texas 1999). These sections contain discussions of the context for each type of resource and attempt to delineate goals.

Several other DLF member libraries have gone much further in strategic planning for electronic resources, and there are interesting differences in their respective planning timeframes. For example, the time span covered by Cornell's Digital Futures Plan is 2000–2002. It seems especially valuable because it targets specific planned actions or outcomes (Cornell 2000). Virginia's Library of Tomorrow plan (University of Virginia 2001) is somewhat more visionary, as appropriate for its five-year scope. Carnegie-Mellon's Digital Library Plan is for an even longer period of time (seven years). It presents three progressively more ambitious levels of project development for different levels of funding: "steady state," "higher profile," and "leading" (Carnegie-Mellon University Libraries 1999). The University of Illinois Library Electronic Collections Plan is notable because it mentions the challenge that licensing poses to its traditional role as a re-

source for other libraries in the state—a concern that is probably shared by many state-funded DLF and ARL libraries (University of Illinois 2000).

The futures projected in these plans and the issues identified in them are somewhat different, but like selection policy documents, they highlight a set of core concerns. These concerns, identified in the following bullets, might serve as a starting point for other libraries interested in forming their own strategic plans for electronic resources, including those to be digitized locally or selected from among freely available Web sites.

- *Value Context.* Decision making should be done with reference to the traditional values articulated by the policy documents mentioned earlier in this section.
- *Funding Issues.* Additional internal funds will need to be reallocated to fund electronic resources, and consortial arrangements will need to be pursued to conserve funds.
- *Scholarly Publishing.* It is important to be proactive and to develop alternative services and publications that libraries and their institutions will be able to afford over time.
- *Licensing and Fair Use.* The emerging reliance on licensing as the basis for access rights poses challenges that must be understood and actively addressed.
- *Evaluation and Usage Information.* Vendors have generally not supplied the kinds of quantitative information that libraries need to evaluate the resources they have licensed. Cross-library efforts are needed to motivate vendors to correct the situation.
- *Archiving.* Archiving is a serious problem that may require maintaining both local print and electronic subscriptions while working toward long-term technical solutions.

2.3. Institutional Finance and Organization

The discussion of costs and expenditures thus far has focused on subscription and purchase prices and on how collaborative action through consortia and publishing initiatives can help control those prices or mitigate their rates of increase. The prices of electronic resources represent only a part of the larger cost picture.

The University of Michigan's 1997 Electronic Resources Task Force Report offers a useful list of some "non-content costs" and shows how those costs might be distributed locally (University of Michigan 1997). Libraries must consider acquisition and processing costs, as well as the costs of providing "intellectual access." For non-electronic resources, the latter costs were attributable strictly to cataloging; however, because electronic resources are now commonly presented through gateway lists, this category also includes the costs of adding and maintaining list entries. An analysis of Drexel University's move toward a completely electronic journal collection found that the costs of acquiring and providing intellectual access to electronic journals were actually higher than those of other formats

(Montgomery and Sparks 2000). The Michigan report also found that access systems (including interface design, application development, and server capacity) and library infrastructure (workstations and connectivity) required more funding. There is also a need for what the Michigan report identified as "user support." Drexel referred to this as "information services" and determined that increased staff time was required for reference support and instruction, preparation of documentation, and selection.

The decision to acquire a given resource must consider these "non-content" costs and ramifications; as has been seen, questions of policy, strategy, and mission may also be involved. It is not surprising that libraries have recently been experimenting with different organizational approaches to these questions. Some have tried to address the apparent tension between centralized and decentralized decision-making models. Several institutions have made large amounts of money available to centralized budget lines. This seems particularly appropriate when resources are heavily interdisciplinary or multidisciplinary, when large amounts of resource funds are involved, or when there is a contractual requirement to maintain a certain level of expenditure with a given publisher. On the other hand, many institutions believe it important that subject selectors or specialists have the leeway to spend noncentral or subject funds for electronic resources without having to go through multiple levels of review and approval. These considerations have prompted some institutions to write guidelines on such questions as how different categories of funds should be used, who should be involved in decision making, and how to develop new committee structures.

A number of interesting but similar organizational models rely heavily on a specially constituted, broadly representative group to make decisions. For example, Yale's Collection Development Council has a Committee for Digital General Resources (CoDGeR) reporting to it (Yale 2000b). This group consists of nearly a dozen members representing various subject or functional areas. Harvard's Committee on Electronic Reference Services includes more than a dozen representatives from a wide range of libraries; in contrast to the Yale model, it reports to the Libraries' Public Services Committee (Harvard 1999).

Some institutions involve subject-oriented groups in discussions and decision making. For example, since the 1980s, Stanford has had an Access to Information Committee reporting to its collection development officer. It has added three resource groups: for humanities, social sciences and government publications, and sciences and engineering. In addition to evaluating resources within their subject areas, each group is expected to maintain contact with the libraries' systems department. Michigan has a steering committee (the "E-Team") plus a core resources group and several other groups that focus on broad subject areas, such as humanities or science (University of Michigan 2000). How these arrangements work in practice and how tied they may be to a particular setting and context are interesting questions that could not be pursued during this project.

Aside from the fact that many staff in these libraries have absorbed several related tasks, there appear to be two fairly distinct and interesting trends in how job tasks are distributed. The first of these is a trend toward having single individuals responsible for coordination or orchestration of electronic resource purchases. There are many examples of these positions among the DLF member libraries and elsewhere. Stanford has recently defined and filled the position of digital program officer, who reports to the collection development officer (Pisani 2000). Harvard has a coordinator for digital acquisitions, who reports to the Systems Department, and MIT has an assistant acquisitions librarian for digital resources. The California Digital Library has a director of shared content.

One of the problems for electronic resource coordinator positions is the broad scope of possible responsibility. To respond to this problem, several institutions have been developing ways to distribute some of the tasks; this emerged as the second trend. The CDL, for example, has defined what it calls resource liaisons, who are responsible for monitoring the "technical and content performance" of major products or product groupings, for reviewing and compiling usage data, and for identifying and communicating "enhancement requests and performance failure reports" to vendors. Harvard has a somewhat similar Resource Stewardship Program, in which "stewards" serve functions similar to those of CDL's resource liaisons (Harvard 2000b, 2000c). MIT has defined the role of product sponsor (MIT 1998c), and Yale maintains a "list of contacts for electronic resources" (Yale 2000a).

2.4. Internal Procedures for Initial Evaluation and Purchase

Many large libraries have invested substantial time and effort in trying to understand, document, streamline or rationalize, and communicate their local procedures for acquiring e-resources. The resulting documentation may be of significant value to other libraries grappling with the same issues. For example, Loghry and Shannon (2000) provide a window onto many operational complexities in their discussion of workflows and forms devised for use at the University of Nevada-Reno. Some MIT internal documents provide especially helpful glimpses into their local process. One of these is a map that illustrates the process of acquiring electronic resources (MIT 1998a). Another is a detailed workflow proposal that deals with ordering, cataloging, managing, and maintaining such resources (MIT 1998b). Although the California Digital Library is larger and more complex than most library systems at single institutions, its acquisitions procedures outline could serve as a helpful template for some of them (California Digital Library 2000a).

Many different pieces of information must be gathered and organized as a particular acquisition makes its way through most local processes. As with the acquisition of traditional materials, much of this information, such as basic descriptive information, vendor, selector or selectors, and fund or funds involved, is fairly standard. For

resources accessed through the Web, the appropriate URL or URLs, relevant user names and passwords, Internet protocol ranges from which they are available, and system requirements are needed. The ability to determine the status of a resource within the overall selection process is also important, and that can be a complex question. For example, libraries typically establish trials of resources that they are considering buying, and it is important to know when and to whom the resources are available for review, how and by whom input about them is to be received, and so on. Establishing funding for large expenditures can also take time, as can resolving license details and issues.

To accommodate the complexity and range of these details, several libraries have developed standardized forms for selectors and other staff. These forms may be used simply as templates for gathering appropriate information, which is then used in paper form—as is the case at Nevada-Reno—or they may be transferred more or less by hand to other systems or Web pages (Loghry and Shannon 2000). In large-scale operations it may be a challenge to track and identify what resources are under consideration or "in process" at a given time. Some large libraries, including Harvard, Yale, the CIC, and the CDL, maintain trial or "status" Web pages for staff and, in some cases, users. Although some of these pages continue to be edited manually, some libraries have developed automated approaches (see Section 2.10).

2.5. Licensing Issues and Practices

One of the biggest and most often-discussed changes facing libraries as they increase their reliance on electronic resources is that the use of these resources is typically governed by contract rather than solely by copyright. The full significance of this development and its impact on libraries have yet to be realized, but there are reasons for concern.

For example, while existing copyright law provides for the time-honored practice of interlibrary loan, licenses may forbid or so constrain this practice that it becomes too costly or otherwise impractical. Such license provisions can undermine a library's ability to continue serving as a regional or state resource. Licenses may also interfere with a library's archival roles and responsibilities if ongoing access rights are excluded or if there are severe restrictions on photocopying. There may also be prohibitions against user copying that the library is unable to enforce. Noncompliance by library staff or end users may permit the vendor to discontinue the service without a refund for time remaining on the contract. In addition, the parent institution may be put at financial risk if its libraries are required to accept responsibility for user actions or agree to indemnify the provider against third-party damage claims. Finally, if, as frequently happens, a distant state's or country's laws and courts are named as the contractual authority, the institution could incur substantial travel and other costs in the event of litigation.

Many of these issues are now widely recognized within the library community, partly because of initiatives that have been organized over the last few years to help educate librarians. For example, for several years ARL has offered excellent training materials and classes for librarians wishing to upgrade their skills and to institute organized local processes for dealing with licensing issues. The popular Liblicense Web site and Liblicense-l listserv have also had considerable impact, because they facilitate discussions among librarians and publishers about licensing issues. Efforts to develop more favorable license terms and standardized language have also been important. For example, the International Coalition of Library Consortia's "Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information" articulates a library-oriented viewpoint on several licensing issues, including fair use and perpetual access rights and liability for user actions (ICOLC 1998a). The concentrated purchasing power within that group has undoubtedly prompted some vendors to be more responsive to the concerns of potential buyers about licensing terms. Some consortia (California Digital Library 2000b, 2000e; Center for Institutional Cooperation 1999) and individual libraries (Harvard 2000a, 2000b; University of Washington 2001a) have clarified and strengthened their bargaining positions by defining their own sets of standardized license terms or requirements. Additional impetus to standardize has been provided by the development of a suite of model licenses by John Cox Associates (Cox 2000), the CLIR/DLF Model License (CLIR 2001), and Liblicense software (Liblicense 2000), which libraries and publishers can use to negotiate mutually agreeable licensing terms.

Despite these noteworthy efforts, libraries may still agree to terms that they regard as less than ideal. For example, if libraries are not required to accept responsibility for user behavior, they may still agree to make "reasonable efforts" to inform users of license terms. Most library compliance efforts have focused on presenting standardized disclaimers to users, such as the following statement found at the top of MIT's database and e-journal lists:

> Use of many of these resources is governed by license agreements which restrict use to the MIT community and to individuals who use the MIT Libraries' facilities. It is the responsibility of each user to ensure that he or she uses these products only for individual, noncommercial use without systematically downloading, distributing, or retaining substantial portions of information (Duranceau 2000a).

It should be relatively simple for libraries to adopt and use such a general disclaimer, but because license details vary from one product or service to another, a general statement may be insufficient to make users aware of relevant terms. Some licenses require that subscribing libraries route their users through a "click-through" page containing standardized language about use restrictions and may also require users to certify that they are eligible to use the product.

It seems impractical for libraries to consider investing the staff time required to write and maintain such pages for a large number of products.

If vendors do not provide rules of use or brief versions of license terms through their Web sites and services, libraries must devise and implement their own ways of tracking license terms and making them available to users and staff. Several libraries have done so. As interesting and promising as their efforts appear to be, there are still significant barriers to developing truly efficient systems for addressing this problem. One alternative that has recently been proposed is for libraries to share the effort of analyzing and reporting license details, much as cataloging effort is shared through bibliographic utilities (Richter 2001, Okerson 2001). Libraries could then incorporate a license profile for a given product into appropriate gateway or catalog descriptions of the resource. This idea seems to have merit, but since licenses for a product can vary among institutions, it could be difficult to establish the canonical version. The development of standard definitions of key provisions could facilitate the growth of such a system.

2.6. Web Presentation Strategies

There are three general strategies for providing access to commercially available electronic resources: local loading by an individual library, loading by a consortium, and relying on vendor sites. Individual libraries have generally been moving away from the local load strategy because of its cost. Consortia have done likewise, although there are notable exceptions, such as OhioLINK. Whether reliance on publisher and vendor services is truly the most cost-effective strategy is an interesting question, since an argument can be made that it entails a range of hidden costs. Local loading provides some important advantages, including control over the number and functioning of user interfaces and normalization of usage measurement.

Presenting electronic resources effectively to users poses challenges for collections of locally digitized, commercially available, and "free" Web resources, and each type of resource has its own distinctive issues and complications. The role online catalogs should play in providing access to these resources is controversial because users accustomed to the Web expect to be able to locate resources through just a few mouse clicks. This is especially true of students who, without a quick means of retrieval, will tend to rely even more extensively on Web search engines than they currently do. A number of institutions have observed that the use of specific resources jumps or declines quickly on the basis of their gateway placement and visibility, and this phenomenon has recently been documented (Ockerbloom 2000).

Large libraries appear to follow a strategy in which resources are presented both through catalogs and e-resource gateways. These gateways typically provide alphabetical or subject lists of databases

or electronic journals, along with an effective gateway search tool. Providing such multiple paths to resources in a cost-effective manner requires establishing synergy between cataloging and the methods used to generate lists, which can be accomplished by systematically deriving metadata from an online catalog system and using it to create a separate database from which resource lists are generated (Jordan 2000). The practice of highlighting and making new resources more visible has also been reflected in the Web pages of a number of libraries, including those at the University of Texas (2000b).

Several writers have pointed to the extent and importance of the trend toward customized services (Ketchell 2000; Lakos and Gray 2000), and there have recently been efforts aimed at providing closer fits between user needs and the organization of resources than may be provided through established subject schema. For example, a system at the University of Pennsylvania organizes resources according to flexibly defined communities of interest (Ockerbloom 2000). In this system, bibliographers identify the resources they believe to be the most critical to a particular user community, and new resources are brought to the attention of users through highlighting. The University of Washington's (UW's) HealthLinks service provides a number of "role-based toolkits" targeting specific user groups, such as administrators, clinicians, instructors, and students (University of Washington 2001e).

Several institutions have taken this approach a step further by introducing fairly simple but effective ways for users to personalize their views of available resources. Among the more prominent efforts in this area are those at Cornell (Cohen et al. 2000; Cornell undated); North Carolina State University (Morgan 1999; Morgan 2000; Morgan and Reade 2000); the University of Washington (Jordan 2000); and the California Digital Library (2000g). Through these systems, once users have identified resources of particular interest, the selected resources are visible as a default when that user logs in to the local system. Though important, such services are unlikely to become the predominant means by which most users will access libraries' electronic resources (Jordan 2000; Ghaphery and Ream 2000).

Both established and newer presentation strategies tend to treat e-resources as distinct entities that are located and then searched and used one at a time. However satisfactory the presentation of distinct databases may be, users may find the effective integration of disparate resources to be just as important. One step in that direction was the development of broadcast search functions, which were introduced first for traditional indexing and abstracting databases. Useful as those functions are, it is also important to integrate full-text content with the indexing and abstracting services.

As suggested in the section on buying strategies, many libraries subscribe to one or more aggregator full-text databases that may cost tens of thousands of dollars and contain full-text coverage for thousands of periodicals. Until recently, few libraries had been able to systematically make users aware of what periodicals were included in which aggregator databases; however, techniques for doing so are

now being developed (Sanders, Goldman, and Fitzpatrick 2000). An important step toward making the content of these collections more visible and usable is the development of the jake (for Jointly Administered Knowledge Environment) initiative (Chudnov, Crooker, and Parker 2000) and the related jake2marc program (Simon Fraser University 2000). Both of these services are available to interested libraries free of charge. jake incorporates periodical holdings or coverage information for nearly 200 databases and enables users to determine which database or databases include a given title. Institutions can customize jake to reflect their own holdings. The jake2marc service uses the jake database to enable libraries to generate catalog records for local use. Companies such as SerialsSolutions and Bell & Howell have also begun to provide full-text list-generation, URL maintenance, or MARC- and MARC-like catalog record services.

Still greater user convenience is provided by systems that provide article-level links between abstracting and indexing databases on the one hand, and aggregator databases and e-journal collections on the other. Several vendors have developed such services. These offerings include PubMed's LinkOut (National Center for Biotechnology Information 2001), Silverplatter's Silverlinker, ISI's Web of Science linking feature, and OCLC's links between their databases and Electronic Collections Online (ECO). Similar services are available from Cambridge Scientific Abstracts, OVID, and others. Though popular, each of these systems has drawbacks, such as the ability to link only to specific islands of content. For example, Silverlinker and ISI links feature offer links only to content from publishers with which these companies have agreements. Similarly, the OCLC linking utility currently works only for e-journals that a library accesses through the ECO service. This means that many links to available and locally licensed content cannot be presented, and differences in vendors' linking coverage can be confusing to users and staff alike. Most also require setup and ongoing maintenance, and since large libraries often have subscriptions to abstracting and indexing databases from multiple vendors, much of this effort must be duplicated.

Libraries clearly have reasons to want more universal, standardized solutions to the problem of providing such links to full text. One new approach is Crossref; an industry-based initiative aimed at enabling article linkages across participating publishers (Brand 2001). Although the initiative includes a significant number of for-profit and nonprofit publishers, it has some drawbacks, the most important of which may be libraries' inability to control which links are enabled. This can be an important issue, since publishers can provide Crossref links only for their "premiere" e-journal services, and links to less-costly alternatives from a given publisher may not work. Some librarians believe that what is needed is a single utility that can be used to establish and maintain full-text links for indexing databases from various publishers and that gives them control over which links are enabled. A particularly promising alternative solution to this problem is the SFX service that is based on open URLs (Van de Sompel and Hochstenbach 1999a; 1999b; 1999c; Van de

Sompel and Beit-Arie 2001). In addition to providing local choice and control of links, SFX enables libraries to administer and maintain links for multiple vendor offerings without duplication of effort.

More visionary is the idea of establishing a broader "scholars' portal" (Campbell 2000) or commons that could be searched more or less like such established Web search engines as Yahoo, Alta Vista, and Google. The advantage of such an approach is that it combines convenient access with appropriately "vetted" academic content. Practical means toward achieving such a vision may be available through metadata harvesting, a method being investigated and developed through the Open Archives Initiative (Open Archives 2001). The viability of the scholars' portal idea may depend on the availability of consistent and comparable metadata, and this may be difficult to achieve.

2.7. User Support

As libraries have increased their investments in electronic resources, providing ongoing support has become more complex. For example, as libraries rely more heavily on access through multiple remote vendors, interfaces and potential points of failure have proliferated. As indexing services and e-journal collections become more closely linked, such "pieced-together" or eclectic systems present additional possible points of failure. Any number of problems may arise for users accessing licensed resources remotely. For example, a particular service may suddenly become slow to respond or unavailable because of technical problems, Web browser configuration or unrelated connectivity issues, or invoicing and payment problems. Users coming to a library's gateway through a commercial Internet service provider may also find services to be unavailable to them and not realize that this is because they have not authenticated themselves through a proxy service.

Most users of Web-based services expect these services to be understandable and usable with a minimum of help or intervention from others. When users do need support, their expectations are high. For example, users may wish to use a consortium's or library's gateway at any time of day and may expect live support at those times. Just what support may be needed and how it is to be provided are continuing questions, and libraries' responses to them are based on local perceptions, resources, and priorities. Of course, users need to know what services are available, who is eligible to use them, and how to connect to them. These basic needs have typically been addressed through the design of gateway Web pages and e-resource lists mentioned in the previous sections. These approaches can be helpfully supplemented by basic "how to use" instructions (California Digital Library 2000f; University of Texas 2000c).

Connectivity and other technical problems are more difficult and seem likely to require ongoing efforts of various kinds. Provision of basic information about how to make a library-specific connection may be necessary (University of Washington 2001b). Lists of known

problems and solutions can be posted for users (University of Washington 2001c), as can browser configuration pages that inform users if they need to adjust settings and that provide information on how to contact staff for help (University of Texas 2000d; University of Washington 2001d). Some libraries have begun to experiment with online "chat" functions for reference and other services (Tennant 1999; LiveRef 2001), and it seems reasonable to suppose that such an approach would work for asking questions and receiving advice on access problems.

Several libraries and consortia have determined that they can respond more effectively to support problems if the work can be distributed among a number of units or individuals, such as those identified as resource coordinators or liaisons. This strategy necessitates some coordination and orchestration; some libraries have done this by establishing and communicating triage paths for different situations. Doing so may be easier if vendor contact information is assembled and maintained centrally.

2.8. Ongoing Evaluation and Usage Information

Libraries have long had a strong interest in knowing how, how much, and by whom their collections are being used. A prevailing motivation has been to focus spending on those parts of the collection that appear to be used most heavily, although it has long been recognized that some specialized materials are likely never to receive much use. Measuring the use of print collections has been approached in various ways; early efforts to develop and apply unobtrusive techniques have given way to reliance on online systems for tracking external circulation and systematically recording in-library use.

It has been possible to track the use of electronic resources for many years, and many libraries have considerable experience gathering, analyzing, and presenting such data for internal and external consumption. In addition, libraries have come to expect vendors to provide usable and useful data. Although it may be possible to state such an expectation fairly simply, defining it has proved to be difficult. Just what should be measured, how the information should be presented, what data might mean, and how they might be used confidently in decision making are all questions without obvious answers.

ARL has recently launched an intensive investigation of some of these questions. The first detailed report on this project (Shim, McClure, and Bertot 2000) identifies three types of situations in which such usage information may be used for decision making. The first category is termed "external resource contracts" and includes the use of data for journal or database renewal or cancellation or for changes in numbers of concurrent users. The second is "reporting and communication" and includes budget justification (the most common response in this category), strategic planning, and comparisons with other institutions. Third is "service assessment and improvement,"

which includes the use of data for the redesign of Web pages, marketing and instruction efforts, staffing changes, and the evaluation or assessment of resources available on a trial basis.

There are some obvious impediments to obtaining data useful for these purposes. First, most libraries currently depend on vendors for usage information, and many supply no data at all. As noted by Luther (2000) in a white paper on e-journal usage statistics, "less than half of the publishers who offer journals in electronic form today are able to provide statistics on the usage of these journals." Second, data provided by different vendors may not be comparable. Again, quoting Luther, "librarians currently receive reports with different data elements that are not clearly defined and that cover different time periods, making it impossible to analyze them in a consistent way." The extent of this problem is indicated by the frequency with which libraries complained about it to the ARL team and by the diversity of measures and other practices reported in the detailed inventory of electronic vendor statistical reporting capabilities reproduced in the team's report (Shim, McClure, and Bertot 2000).

A number of responses to these problems warrant mention. First, it is important that libraries institutionalize evaluations of their electronic resources on the basis of what is currently available from vendors. One part of such a strategy may be to treat the available information, despite its inconsistencies and other problems, as good enough for "best guess" decision making. Such an outlook has been adopted by Virginia Tech, which routinely assembles the available data into simple but useful spreadsheets. Yale has also established clear Web pages for reporting usage information to interested staff (Shim, McClure, and Bertot 2000), as have several other libraries, including Harvard (2000d). Another useful strategy is to adopt a plan for evaluating each resource before renewal and to distribute responsibility for the evaluation, a practice adopted by Harvard's resource stewards and coordinators (Harvard 2000b; 2000c; 2000e) and the CDL's resource liaisons (California Digital Library 1999e, 1999f, 2000c).

Second, it is important for libraries and vendors or publishers to reach a consensus on standard definitions and reporting practices. The International Coalition of Library Consortia took a significant step in this direction when it published its Guidelines for Statistical Measures (ICOLC 1998b). This document provides a reasonable standard that many vendors have already attempted to reach. The group is reviewing the guidelines and vendor responses, and it plans to review the extent of vendor compliance, which may have further positive impact. The ARL E-metrics initiative may also hold potential for establishing additional consensus, as well as for encouraging reform and standardization of vendor practice. Finally, when vendors do not provide what individual libraries need, it is important that they be encouraged to do so.

Standardization need not be the only goal of measurement efforts. Libraries and consortia such as OhioLINK, which rely on their own equipment and staff for access to electronic resources, are well

positioned to develop and initiate measurement and presentation methods that could become standards in the future. The usage measurement and presentation methods developed at the University of Pennsylvania demonstrate that it is possible to be innovative without an extensive local investment in infrastructure (Shim, McClure, and Bertot 2000). Some libraries are also attempting to show how electronic resources affect student learning or facilitate research productivity (Blixrud 2000; Smith 2000). If successful, these efforts could also be widely emulated.

2.9. Preservation and Archiving

The need to preserve electronic resources and continue to make them available has been recognized for years, but only recently have there been serious and broad-based efforts in this area. One reason is that many libraries now have experience with significant numbers of electronic journals and have started to consider whether they can truly afford both online and print subscriptions. The prospect of relying completely on electronic access to large numbers of journals or other resources raises a number of questions. For example, if libraries rely completely on electronic access and have to cancel their electronic subscriptions in the future, or if the publisher goes out of business or discontinues access to older content, the library risks losing access to back issues. If the publisher provides libraries with electronic files in those eventualities, how are libraries to use them? Last, there is increasing awareness that electronic versions of journals may differ significantly from printed versions. Electronic versions may include video and sound clips, special-purpose data requiring specific software, and links to ephemeral Web sites that may be difficult or impossible to archive.

Several recent articles have explored the meaning of electronic archiving and who should take responsibility for it (Anderson 2000; Boyce 2000; Douglas 2000; Graham 2000; Hunter 2000; Leggate and Hannant 2000; Marcum 2000; Morris 2000). There seems to be a growing consensus that although publishers might be expected to provide archival access in the short term, libraries are the appropriate agencies to serve this function for posterity. Possible costs of long-term preservation could be substantial, if, for example, data must be frequently refreshed and migrated or if emulation software must be developed and maintained (Rothenberg 1999, 2000). Most libraries will have difficulty devoting substantial local funds to these activities.

A few key and related initiatives take on special significance in this context. The first is the effort by the Council on Library and Information Resources (CLIR) and the DLF to establish shared understandings within and across the publishing and library communities about the elements that will be required to successfully establish working archival repositories. The second is The Andrew W. Mellon Foundation's award of planning grants to a number of larger libraries. CLIR identifies the roles of these libraries as follows:

Yale, Harvard, and the University of Pennsylvania will work with individual publishers on archiving the range of their electronic journals. Cornell and the New York Public Library will work on archiving journals in specific disciplines. MIT's project involves archiving "dynamic" e-journals that change frequently, and Stanford's involves the development of specific archiving software tools (Digital Library Federation 2001).

The importance of these efforts to publishers and libraries is indicated by a joint announcement by Yale and Elsevier of their intent to work together on this problem (Yale 2001). Both parties hope to establish a model archive within the next two or three years.

2.10. Toward Integrated Systems for Managing Electronic Resources

Several locally developed computer-based systems for acquiring, managing, and supporting electronic resources were identified during the research for this project. Among them were MIT's VERA system (Duranceau 2000a, 2000b; Hennig 2001), Penn State's ERLIC (Stanley, Holden, and Nirnberger 2000; Pennsylvania State University 2001), and the License Tracker system developed at the University of Texas at Austin (Rowe 2000). These and other systems were found at larger institutions with significant levels of investment in electronic resources and substantial organizational complexity. In some cases, considerable amounts of staff time have been devoted to designing, implementing, and maintaining them.

Although these electronic resource management systems vary in purpose and function, they have all been implemented to remedy perceived deficiencies in these institutions' online cataloging, acquisitions, or other systems. For example, some are used to generate alphabetical lists of databases and electronic journals or to keep track of important license terms. Some integrate the listing and license tracking functions; others focus on tracking acquisition status or organizing technical information. As these systems' similarities and common functions began to emerge, the value of a more thorough and systematic inventory became apparent. That is, if many libraries are trying to solve much the same problem, it might be possible to devise common functional and data definitions and standards that could be used as the basis for future design and implementation work—by libraries working individually or collectively or by vendors.

With this in mind, the author and another librarian at the University of Washington performed a thorough review of known electronic resource management systems. On the basis of this initial review, a coding form containing appropriate functions and data elements was developed and used to profile the systems. Staff at the institutions having relevant systems generally performed these reviews, but UW staff analyzed a paper-based system in place at the University of Nevada-Reno on the basis of a published article about it (Loghry and Shannon 2000). In some cases, UW staff did an initial

analysis of a system's functions and data elements and sent it for review to staff at the library responsible for that system. Thirteen electronic resource management systems were analyzed. These included the four already mentioned (MIT, Penn State, Texas, and Nevada-Reno) and five other systems that are in place and operating (Michigan, Notre Dame, Simon Fraser, Virginia, and Yale). Three of the remaining systems analyzed (Cornell, Stanford, and UCLA) are in various phases of planning or development. A similar analysis of functions and data elements was also done for the University of Washington, although its current system consists of its Innovative Interfaces system, Digital Registry, and paper-based license file and inventory tool.

The results of the analysis are summarized in a spreadsheet in Appendix B: Functions and Data Elements for Managing Electronic Resources. The systems are presented in three categories: paper-based, systems in production, and systems in planning or development. The appendix lists nearly 150 functions or data elements, although careful analysis will probably reveal some overlap. Seven fairly distinct functional areas were identified, including listing/descriptive; license-related; financial/purchasing; process/status; systems/technical; contact and support; and usage. For the first category, it seemed useful to distinguish between "listing or reporting" functions and the data elements themselves. That distinction seemed less clear or relevant for the other categories.

The spreadsheet points to some interesting similarities and differences among these systems. First, they are based on several different database software packages or other platforms, although Filemaker and Microsoft Access are in use at five of the institutions. As seen in category 1.A. of the spreadsheet (listing and descriptive functions), several of the systems are used to generate "production" alphabetical and subject lists of resources for users and staff. Separate lists of databases and electronic journals are frequently generated, and several libraries generate "composite" full-text lists that include both e-journals and coverage by "aggregator" full-text database providers. A few libraries also generate lists by "package" or publisher. Many of the data elements used to describe print resources, such as title and publisher, are shown in category 1.B (listing and descriptive data elements). A few fields that are particularly appropriate or uniquely relevant for electronic resources are also shown, such as description, genre, and inclusion of full-text. Two institutions also facilitate their reporting of e-resource expenditures to ARL by recording appropriate expenditure categories from the ARL Supplemental Survey.

License term recording and display practice (Section 2) is somewhat more varied. Several institutions track and display common license terms for users and staff. For example, Yale's system uses a clear, standardized format to inform users whether a resource can be used for Interlibrary Loan, e-reserves, or course packs. MIT had one of the more interesting display strategies. In addition to a standardized notice about appropriate and prohibited use, MIT's resource

lists display a red "L" icon appears when a license for a resources contains specific terms of which users and staff should be aware. When the icon is clicked on, the terms are displayed (Hennig 2001). Several institutions record and display links to electronic versions of their licenses, and Penn State has initiated a special project to digitize and make its licenses available.

As noted, libraries rely extensively on established online acquisitions systems for tracking and reporting financial details (Section 3). Whether the complexities involved in e-journal pricing and their many permutations can be successfully captured in this way is open to some question, however. Interestingly, several libraries try to save key e-mail correspondence with vendors because they record important transaction details.

Where traditionally designed online acquisition systems appear to be least successful in supporting the purchase of electronic resources is in how they allow for coverage of "process" or status information (Section 4). The importance of doing so is indicated by the fact that most of the electronic resource management systems incorporate some sort of "order status" information. However, the range of relevant system characteristics suggests that devising a standardized approach to process tracking may be difficult. One reason for this is that keeping track of a resource as it passes through the local acquisition process is likely to require steps that are highly specific to a given institution.

Several of the systems track and provide reports of upcoming renewals. This is important for two reasons. First, an unpaid invoice may result in the sudden interruption of an institution's access to an electronic resource. Second, as mentioned in the section on evaluation and usage information, several libraries and consortia conduct cyclical reviews of electronic resources prior to renewing them. It would be difficult to plan for and coordinate such reviews without being able to see which resources will be up for renewal at what time. A couple of institutions have also included a "follow-up needed" reporting function in their local e-resource management systems, which should help prevent staff from losing track of problems.

Section 5 of the spreadsheet summarizes the technical and access details that are routinely recorded to assist in managing collections of e-resources. Six of the systems allow for tracking availability or "problem status," which is important when collections consist of resources from dozens of vendors. An attractive feature of the VERA system is that a special "resource broken" icon can be displayed on resource lists when a resource is unavailable. To support multiple vendor offerings, the recording of vendor billing and technical support information is also required, and most of the systems evaluated allow for that (Section 6). In addition, most allow for the identification of an internal contact person who might be responsible for resolving a particular problem and reporting back on it to staff and users. A few of these systems also allow for recording where usage information can be obtained or include a usage reporting function (Section 7).

3. Conclusions and Future Considerations

One of the goals of the DLF Collection Practices Initiative was to identify "best practices." This goal began to seem overly ambitious as research for this report progressed and as more and more complexities and specialized local circumstances surfaced. Therefore, it seems more appropriate in closing to identify a few practices that appear to be effective or that seem to be promising. On the basis of this and future work, more definitive "best practices" may perhaps be defined.

Before doing so, it is important to recall that the introduction to this report noted that commercially available resources must be affordable for libraries to be able to build and sustain significant collections of them. That comment served as the rationale for exploring two strategies for controlling costs—consortial purchasing and scholarly communication initiatives. The recent literature concerning these strategies indicates that there is much to be said for each. Because of that, and because it is difficult to assess their current impact or to predict how either might help control prices for electronic resources over the long term, neither is being put forward here as an "effective practice." Affordability remains a necessary precondition for sustainability, however.

Leaving such strategies and related controversies aside, it was still difficult to choose objectively from among the practices discussed in the other sections of this report. Nevertheless, a selection was made and is presented as Table 2. Another researcher could easily have chosen differently, and that element of subjectivity should be kept in mind when reviewing it. Table 2 follows the organization of the text and the list of practices and links in Appendix A; for this reason, only a few brief comments are given. Readers may refer to the appropriate text and appendix sections for more information.

The discussion of selection policies and strategic plans emphasized that it is important for libraries to articulate what they wish to achieve through the acquisition of commercial electronic resources and to identify the values that should inform their decision making. Creating strategic plans for e-resource collection development—especially plans that incorporate concrete steps and benchmarks—seems to be another worthwhile activity. For large libraries, the purchase and presentation of electronic resources is a complex process involving large numbers of staff. Coordination of decision making and other activities is a significant problem. Quite often coordination is achieved partly through one or more e-resource committees, for which there are many interesting organizational models. An important emerging role that appears to be common to many institutions is that of e-resource coordinator. Finally, as resources grow and diversify, it seems inevitable that support responsibility for electronic resources must be distributed across the organization. As a result, a number of institutions have defined a separate but complementary

stewardship role that different staff will take on for specific resources or platforms.

The acquisition of electronic resources can be operationally complex, and efforts to make the local process more coherent are important. Steps such as systematizing and documenting workflows, organizing and providing standardized information for vendors, and adopting appropriate forms all hold potential for expedited order handling. Managing the licensing of electronic resources is also one of the bigger challenges that libraries now face. Operationally, effective local licensing practice requires the adoption of clear policies and responsibilities as well as the creation and communication of smooth processes for dealing with them.

Ideas about how best to present licensed resources to users continue to emerge rapidly. Recent initiatives aimed at making the con-

	Topic Area	Suggested Practices
2.2	Selection Policies and Strategic Plans	• Create well-developed selection guidelines and policies • Articulate goals and strategic approach for developing e-resources
2.3	Institutional Finance and Organization	• Create broad-based oversight/coordination committee structures • Appoint e-resource coordinators • Distribute responsibilities for resource stewardship
2.4	Internal Procedures for Initial Evaluation and Purchase	• Create systematic, understandable workflows; use appropriate forms to expedite handling • Make it easy to determine the order status of a given e-resource • Make standardized information about the library (FTEs, IP ranges, site definition, licensing policies) available to vendors • Establish a clear system of conducting trials that includes communication of availability and process to staff (and users, if appropriate)
2.5	Licensing Issues and Practices	• Establish process for smooth handling of licenses with clearly stated policies and responsibilities • Systematically inform staff and users about general and specific licensing terms
2.6	Web Presentation Strategies	• Make aggregator database periodical holdings visible to users • Link abstracting & indexing database citations to e-journal holdings • Present resources and services in a way that meets users needs and that they can personalize ("My Gateway")
2.7	User Support	• Make general support information readily available to users • Create comprehensible problem escalation/triage paths for staff
2.8	Ongoing Evaluation and Usage Information	• Conduct planned/cyclic reviews prior to renewal • Systematically report usage to staff
2.9	Preservation and Archiving	• Support joint efforts to establish preservation techniques and standards • Realistically assess the preservation and access risks of relying on electronic formats, and develop an archive strategy on the basis of local circumstances and risk tolerance
2.10	Toward Integrated Systems for Managing Electronic Resources	• Put in place plan e-resource support systems

Table 2. Idealized Model of Effective Selection and Presentation Practices

tents of aggregator databases more visible to staff and users and at linking indexing databases to licensed e-journal collections enable libraries to derive more benefit from those resources. Establishing open standards for both seems important, for to do otherwise may mean supporting multiple vendor-specific systems. Efforts to better identify and meet the needs and interests of particular user groups, as well as to enable users to personalize their own views of relevant resources based on their own interests and usage patterns, also stand out.

Extensive reliance on vendors for access to e-resources, and the attendant proliferation of interfaces and possible sources of problems, is likely to necessitate a creative look at how the support function can best be organized. Establishing clear problem-triage paths is an important step. Reliance on vendor performance has also been problematic for libraries that rely on vendors exclusively for usage information. Ongoing efforts to establish standards for such data and to urge vendor compliance are quite important, and individual libraries should support those efforts in their contacts with vendors. The systematic, ongoing presentation of such data to staff and its review under organized, ongoing programs when resources are up for renewal also seem to qualify as effective practice.

Although clear solutions are not yet on the horizon, it is extremely encouraging that a number of organizations and libraries are taking a keen interest in archiving and preserving electronic resources.

Finally, it is clear from the time and effort invested by many libraries creating local systems for managing electronic resources that existing library management systems and software lack important features and functionality. Although developing local systems probably contributes to effective local practice, coordinated efforts to define needs and establish standards may prove to be of broad benefit.

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2.1 Economic Context of Electronic Resource Selection		
• *Pricing Structures and Consortial Purchasing*	ICOLC	Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information <http://www.library.yale.edu/consortia/statement.html>
• *General Resources*	ARL	Office of Scholarly Communication <www.arl.org/scomm>; Tempe Principles for Emerging Systems of Scholarly Publishing <http://www.arl.org/scomm/tempe.html>; SPARC <www.arl.org/sparc>; Create Change <www.createchange.org>; Declaring Independence <www.arl.org/sparc/DI>
• *E-print/E-Publishing Initiatives*	CDL	e-scholarship <http://escholarship.cdlib.org/>
	LANL	arXiv: Los Alamos Physics Preprint Database <http://arxiv.org>
	NIH	PubMed Central <www.pubmedcentral.nih.gov>
	Open Archives	Open Archives Initiative <www.openarchives.org>
• *Publishing Initiatives*	Big 12 Plus Consortium	BioOne <http://www.bioone.org>
	Columbia	CIAO (Columbia International Affairs Online) <http://www.ciaonet.org/>; Columbia Earthscape <http://www.earthscape.org>
	Cornell	Project Euclid <http://projecteuclid.org>
	Johns Hopkins	Project Muse <http://muse.jhu.edu>
	Stanford	Highwire Press <http://highwire.stanford.edu>
2.2 Selection Policies and Strategic Plans		
	CDL	CDL Collection Framework <http://www.cdlib.org/libstaff/sharedcoll/docs/framework.pdf>; CDC Principles for Acquiring and Licensing Information in Digital Formats <http://sunsite.berkeley.edu/Info/principles.html>; Joint Steering Committee Criteria for Priority Selection <http://www.cdlib.org/libstaff/sharedcoll/jsc/PriorityPoints.rtf>; Tiered Approach for Access to Purchased Electronic Content <http://www.cdlib.org/libstaff/sharedcoll/docs/tiers.rtf>
	Library of Congress	Collections Policy Statements: Electronic Resources <http://lcweb.loc.gov/acq/devpol/electron.html>
	MIT	Toward a Networked Resources Policy <http://macfadden.mit.edu:9500/networked/policy.html>
	Texas	General Libraries Digital Library Collection Development Framework <http://www.lib.utexas.edu/admin/cird/policies/subjects/framework.html>; General Libraries Electronic Journal Strategy <http://www.lib.utexas.edu/admin/cird/ejournalstrategy.html>

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2.2 Selection Policies and Strategic Plans (contd.)	USC	University of Southern California Library Collection Development Policy Statement for Information in Electronic Formats <http://academic.uofs.edu/organization/codes/uscl.html>
	Washington	Selection Guidelines for Internet Resources <http://staffweb.lib.washington.edu/irc/policies/internetselguide.htm>
• *Evaluation Checklists*	CDL	Database Selection Criteria <http://www.cdlib.org/libstaff/system_services/tswg/database_selection_criteria.rtf>; Resource Selection/Evaluation Criteria <http://www.cdlib.org/libstaff/system_services/tswg/Database_Selection_Criteria_v4.rtf>
	Penn State	Evaluating Electronic Resources <http://www.libraries.psu.edu/crsweb/select/manual/guide.htm>
	Yale	Examining Networked Resources (includes checklists for Content, Presentation, Technical, Licensing and Business Arrangements, and Service Impacts) <http://www.library.yale.edu/ecollections/ereschecklist.pdf>
• *Strategic Plans*	CDL	CDL Mission and Strategic Goals <http://www.cdlib.org/about/planning/mission.html>
	Carnegie Mellon	Digital Library Plan, 2000-2007 <http://www.library.cmu.edu/Libraries/digitallibrary.pdf>
	Cornell	Cornell University Library Digital Futures Plan: July 2000 to June 2002 <http://www.library.cornell.edu/staffweb/CULDigitalFuturesPlan.html>
	Illinois	University of Illinois Library Electronic Collections Plan (November 2000)
	Library of Congress	LC21: A Digital Strategy for the Library of Congress <http://books.nap.edu/books/0309071445/html/1.html>
	Virginia	Building the Library of Tomorrow <http://staff.lib.virginia.edu/LofT/>
2.3 Institutional Finance and Organization		
• *Funding/Budgeting Strategies*	CDL	Sharing Costs of Electronic Resources Among UC Campuses <http://www.cdlib.org/libstaff/sharedcoll/toolkit/costshareweb.PDF>
	MIT	Guiding Principles for Use of Central Networked Resources Fund <http://libraries.mit.edu/notice/netwguide.htm>
	Yale	Central Fund for Multi-disciplinary Digital Resources (brief principles document for use of central fund) <http://www.library.yale.edu/ecollections/Central%20Fund.html>
• *Committee Structures*	CDL	Joint Steering Committee on Shared Collections (document password protected) http://www.cdlib.org/libstaff/sharedcoll/jsc/; JSC Charge <http://www.cdlib.org/libstaff/sharedcoll/jsc/JSC_charge.rtf>
	Cornell	Database Review Committee <http://www.englib.cornell.edu/cul/a2i/drc/default.html>; Electronic Resources Committee <http://www.library.cornell.edu/staffweb/ERC/ERC.html>
	Harvard	Committee on Electronic Reference Service <http://hul.harvard.edu/cmtes/ulc/coers>
	Michigan	Electronic Resources Task Force Report <http://www.lib.umich.edu/libhome/staff/eresources/TFreport.html>; Selection Structure (includes e-team; core resources team, subject teams) <http://www.lib.umich.edu/libhome/staff/eresources/structure.htm>
	MIT	NERD (Networked Electronic Resources Discussion Group)

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Committee Structures (contd.)	Stanford	Stanford University Libraries/ Academic Information Resources (presentation at Digital Library Federation Spring Forum, April 12, 2000. Discusses committee structure, including access to information committee; resource groups for humanities, social science/government publications, science and engineering, which deal with content and data appropriate to those areas.) <http://www.clir.org/diglib/forums/spr2000/stanford/index.htm>
	Yale	CoDGer (Committee for Digital General Resources) <http://www.library.yale.edu/CDC/public/subcommittees/codger/>
• *Selection Roles*		
❑ E-Resource Coordinators	Harvard	Coordinator for Digital Acquisitions (Ivy Anderson)
	MIT	Assistant Acquisitions Librarians for Digital Resources (Ellen Durancea)
	Stanford	Digital Library Program Officer (Paul Zarins)
❑ Resource-Specific Coordination/Stewardship	CDL	Resource Liaisons <http://www.cdlib.org/libstaff/sharedcoll/liaisons/> (page includes Charge) <http://www.cdlib.org/libstaff/sharedcoll/liaisons/charge.rtf>; Resource Liaisons and Usage Statistics <http://www.cdlib.org/libstaff/sharedcoll/liaisons/UsageStatistics_Goals.rtf>
	Harvard	Resource Stewardship Program <http://hul.harvard.edu/digacq/stewards.html>; Responsibilities of Stewards and Coordinators <http://hul.harvard.edu/cmtes/ulc/coers/stewards_coordinators.htm>; Stewards' Checklist <http://hul.harvard.edu/cmtes/ulc/coers/checklist.htm>
	MIT	Product Sponsor (see Partnership Between Product Sponsor and Assistant Acquisitions Librarian for Digital Resources) <http://macfadden.mit.edu:9500/networked/partnership.html>
	Yale	Contact Information for Electronic Resources Licensed by Yale University Library <http://www.library.yale.edu/ecollections/contactinfo.html>
2.4 Internal Procedures for Initial Evaluation and Purchase		
• *E-Purchase Procedures*	CDL	CDL Acquisitions Procedures (revised 1/5/2000) <http://www.cdlib.org/libstaff/sharedcoll/docs/acquisitions_proc.rtf>; Tier 2 Acquisitions Procedures <http://www.cdlib.org/libstaff/sharedcoll/toolkit/cdltier2.rtf>
	Michigan	Checklist for Acquisition of E-resources <http://www.lib.umich.edu/libhome/staff/eresources/checklist.html>
	MIT	Process Map for Acquisition of Electronic Information Products <http://macfadden.mit.edu:9500/networked/webmap.pdf>; ERESCAT/NERD Subgroup on Workflow for Electronic Resources Workflow Proposal <http://macfadden.mit.edu:9500/networked/erescat.htm>; Vera Procedures for Subject Specialists <http://macfadden.mit.edu:9500/webgroup/vera/procedures.html>
	Penn State	Adding Electronic Resources <http://www.libraries.psu.edu/crsweb/select/manual/guide2.htm>

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E-Purchase Procedures (contd.)	Yale	Timeline for Selection of Electronic Resources <http://www.library.yale.edu/ecollections/timeline.html>; Electronic Resource Evaluation Checklists <http://www.library.yale.edu/ecollections/ereschecklist.pdf>
• *E-Purchase Forms*	Cornell	Networked Electronic Resource Form <http://www.library.cornell.edu/voyager/Order/netrescatform.html>
	Harvard	Nomination Form (Hollis Resource Acquisition Request) <http://hul.harvard.edu/digacq/nomination.html>
	Michigan	E-Resources Processing Forms (includes Order/Cataloging form, Cataloging Only form and FAQ) <http://www.lib.umich.edu/libhome/staff/eresources/eresources_processing.htm>
	MIT	New Electronic Resources: Proposal for Purchase <http://macfadden.mit.edu:9500/networked/suggestedres.html>; Digital Resources Change Report Form <http://macfadden.mit.edu:9500/networked/urlreportform.htm>
	Texas	E-Journal Addition Request/Order Form <http://staff.lib.utexas.edu/divisions/cird/Credits/serialorder.html>
	Yale	E-resources Order Form for SML Selectors <http://www.library.yale.edu/ecollections/SMLeorders.pdf>
• *Vendor Information Pages*	CDL	CDL Content Provider Information Resource Page (includes Proposal Guidelines for Producers of Electronic Products) <http://www.cdlib.org/about/publisher_info_pub/>
	Harvard	Instructions for Vendors (includes licensing electronic resources at Harvard University; instructions for vendors (pdf); technical questionnaire and ip ranges) <http://hul.harvard.edu/digacq/vendors.html>
	Penn State	Internal pages listing IP ranges, etc.
• *Status Pages*	CDL	CDL "In Process" Collections (public and passworded update documents)
	CIC	CIC Agreement Tracking Status Page <http://www.cic.uiuc.edu/cli/contracts/statpage.html>; CIC Contract Tracking Homepage <http://www.cic.uiuc.edu/cli/contracts/index.html>
	Texas	Collection Development and Management Group (CDMG) maintains a Potential Purchases page <http://staff.lib.utexas.edu/~dillon/databases.html>; License Tracker shows status through UT system <http://pcl-a382.lib.utexas.edu/OnlineServices/search.html>; License agreements; outline of license process. <http://staff.lib.utexas.edu/divisions/dlsd/dls/process/index.html>
• *Staff Only Trial Pages*	Harvard	Resources Under Consideration and on Trial (staff only); Prospective Hollis Resources
	MIT	Networked Resources Page (has links to trials page and information on NERL and NELINET deals) <http://macfadden.mit.edu:9500/networked/>

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▪ *Public Trial Pages*	Emory	Trial Database option listed on gateway database list <http://www.library.emory.edu/IG/demodb.html>
	Indiana	Experimental Projects: Trials and Demos (public) <http://www.indiana.edu/~libcodev/trials.html>
	Many (e.g.,Texas, Yale)	Includes test databases in public e-resource lists.
2.5 Licensing Issues and Practices		
▪ *Model Licenses and Guidelines*	CLIR	Liblicense Web site <http://www.library.yale.edu/~llicense/>; LIBLICENSE Guide to Digital Information (software) <http://www.library.yale.edu/~llicense/software.shtml>; CLIR/DLF Draft Model License <http://www.library.yale.edu/~llicense/modlic.shtml>
	ARL	Licensing Issues page <http://www.arl.org/scomm/licensing/index.html>; Principles for Licensing Electronic Resources <http://www.arl.org/scomm/licensing/principles.html>
	ICOLC	Statement of Current Perspective and Preferred Practices for the Selection and Purchase of Electronic Information <http://www.library.yale.edu/consortia/statement.html>
	CDL	CDL Model License <http://www.cdlib.org/libstaff/sharedcoll/toolkit/CDLModelLicense1-12-00.rtf>; Checklist of Points to be Addressed in a CDL License Agreement <http://www.cdlib.org/libstaff/sharedcoll/docs/checklist.pdf>
	CIC	Standardized Agreement Language (Revised May 17, 2000) <http://www.cic.uiuc.edu/cli/contracts/standardized_agreement_language.htm>
	Harvard	Guidelines for Licensing Electronic Resources at Harvard University (staff only – password controlled); Licensing Electronic Resources at Harvard University: Guidelines for Vendors <http://hul.harvard.edu/ldi/resources/vendor.guidelines.pdf>
	Washington	Information Resources Council Task Force on Electronic Information Acquisition and Licensing: Draft Principles, Guidelines and Checklists (example of a policy still in process of discussion) <http://staffweb.lib.washington.edu/irc/comm-taskforces/tf_licensing_checklists.html>
▪ *License Term Communication*		
❑ General Disclaimers	MIT	E-journal and database browse pages have this header statement: "Use of many of these resources is governed by license agreements which restrict use to the MIT community and to individuals who use the MIT Libraries' facilities. It is the responsibility of each user to ensure that he or she uses these products only for individual, noncommercial use without systematically downloading, distributing, or retaining substantial portions of information." <http://libraries.mit.edu/vera>

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❑ Intermediate Pages	Washington	Web of Science page <http://www.lib.washington.edu/databases/isi/wos.html>; Lexis-Nexis Academic Universe page <http://www.lib.washington.edu/databases/LexisNexis/>
❑ Key/Excerpted Terms to Staff/Users	CD	E-Journal ILL List <http://www.cdlib.org/libstaff/sharedcoll/liaisons/E-Journal_ILL.html>
	MIT	Has "Ill: resources that allow interlibrary loan" with specifics <http://libraries.mit.edu/verareports>
	VIVA	ILL Provisions in VIVA's contracts for Full Text Resources <http://www.gmu.edu/library/fen/viva/illcontr.html>
	Yale	Electronic Database and Journal Licensing Information by Vendor (shows copy, download ILL, coursepack, etc., permissions) <http://www.library.yale.edu/journals/licensing.html>
❑ Link to License Text or Images	CDL	CDL Redacted License Agreements <http://libnet.ucsd.edu/cdl/licenses.html>
	MIT	Public lists of databases and e-journals (see http://river.mit.edu:591/mitlibweb) contain an "L" icon when license terms are available. Also provides "License Agreements (links to licenses we have scanned)" for staff.
2.6 Web Presentation Strategies		
• *General*	Penn	Communities of Interest as organizing principle/idea; prioritized lists of e-resources by community (see DLF Forum Presentation: "Let's Get Together; Or, How to Integrate Library Resources so Our Users Can Find Them") <http://www.clir.org/diglib/forums/fall00/ockerbloom.htm>
• *Personalization ("My Gateway")*	CDL	MyLibrary@CDL Release Notes <http://www.cdlib.org/libstaff/july2000/mylibrary/>
	Cornell	MyLibrary@Cornell <http://mylibrary.cornell.edu>
	N.C. State	About MyLibrary <http://my.lib.ncsu.edu/?cmd=about&id=39>; MyLibrary@NCState. <http://hegel.lib.ncsu.edu/development/mylibrary/>; MyLibrary: A Model for Implementing a User-centered, Customizable Interface to a Library's Collection of Information Resources <http://hegel.lib.ncsu.edu/development/mylibrary/sigir-99/>
	Washington	Why use My gateway? (includes link to temporary guest account option) <http://www.lib.washington.edu/resource/help/MyGateway.html>; MyUW <http://myuw.washington.edu/>; About MyUW. <http://myuw.washington.edu/about.html>
• *Aggregator Content Listings* *Aggregator contents represented in online catalog or Web gateway lists*	Yale	jake (Jointly Administered Knowledge Environment) customizable for various local environments <http://jake.med.yale.edu/docs/about.html>; jake2marc (utility for generating marc records from the jake database) <http://www.lib.sfu.ca/kiosk/mjordan/jake/>
	Various	Incorporation of vendor MARC records (e.g., Bell & Howell's program) or alternate record sets (e.g., the Bryn Mawr/Haverford set for Academic Universe)
• *E-Journal Links to A & I Services*	PubMed	LinkOut function <http://www.ncbi.nlm.nih.gov/entrez/query/static/linkoutoverview.html#Libraries>
	DLF	NISO/DLF/CrossRef Workshop on Localization in Reference Linking Meeting Report <http://www.niso.org/CNRI-mtg.html>

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• *Metadata Harvesting and Open Archives Initiative*	ARL	The Case for Creating a Scholars Portal to the Web: A White Paper (Jerry Campbell) <http://arl.cni.org/newsltr/211/portal.html>
	DLF	The Open Archives Initiative and Digital Libraries <http://www.diglib.org/architectures/mdharvest.htm>; A New Approach to Finding Research Materials on the Web <http://www.diglib.org/architectures/vision.htm>; DLF evaluation of the Open Archives Initiative <http://www.diglib.org/architectures/testbedpv.htm>
2.7 **User Support**		
• *General*	MIT	Support for End-users of Libraries' Networked Resources
	CDL	CDL User Guides <http://www.cdlib.org/guides/>
	Texas	UT Library Online User Guides <http://www.lib.utexas.edu/guides/index.html>; Off-Campus Access to Library Databases and Electronic Resources <http://proxy.lib.utexas.edu/help.html>; Problems and Alerts <http://www.lib.utexas.edu/help/alerts.html>
	Washington	Known Issues and Bugs <http://www.lib.washington.edu/help/knownissues/>; Connecting to the Libraries <http://www.lib.washington.edu/help/connect.html>; Proxy Server Wizard (includes link to browser compatibility test page) <http://www.lib.washington.edu/asp/browser/proxy.asp>
• *Escalation/Triage Paths*	CDL	Problem triage chart under discussion
	Cornell	Library Gateway User Support Procedures Outline <http://www.people.cornell.edu/pages/hlm7/GWSupportOutline.htm>; Library Gateway Standard Responses <http://www.people.cornell.edu/pages/hlm7/GWStandardResponses.htm>
	MIT	Vendor Contact Information for Tech Support (provides internal "escalation path" plus vendor contact details.) <http://creek.mit.edu:591/mitlibweb/FMPro?-db=Resource.fp3&-lay=web&-format=vendorlist.htm&-view>
	Penn State	Contact page for librarians and staff.
2.8 **Ongoing Evaluation and Usage Information**		
	ICOLC	Guidelines for Statistical Measures of Usage of Web-based Indexed, Abstracted, and Full Text Resources (Nov. 1998) <http://www.library.yale.edu/consortia/webstats.html>
	ARL	Measures for Electronic Resources (E-Metrics) <http://www.arl.org/stats/newmeas/emetrics/> ARL E-metrics Project: Developing Statistics and Performance Measures to Describe Electronic Information Services and Resources for ARL Libraries (Jeff Shim, Chuck McClure, John Bertot, et al., Nov. 2000) <http://www.arl.org/stats/newmeas/emetrics/phaseone.pdf>
	CLIR	White Paper on Electronic Journal Usage Statistics (Judy Luther, Oct. 2000) <http://www.clir.org/pubs/reports/pub94/contents.html>
	CDL	CDL Statistics (much is password protected) <http://www.cdlib.org/libstaff/stats>

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2.8 Ongoing Evaluation and Usage Information (contd.)	Harvard	HOLLIS and HOLLIS Plus Statistics <http://hul.harvard.edu/ois/services/reporting/rptstats.html>
• *Planned/Cyclic Reviews Prior to Renewal*	CDL	CDL Contract Renewal Dates <http://www.cdlib.org/libstaff/sharedcoll/liaisons/Renewal_dates.html>
	Harvard	Re-evaluation of Digital Resources <http://hul.harvard.edu/cmtes/ulc/coers/Re-evaluation1.htm>
2.9 Preservation and Archiving		
	CLIR and DLF	Minimum Criteria for an Archival Repository of Digital Scholarly Journals <http://www.clir.org/diglib/preserve/criteriapv.htm>; A Framework for Sharing Digital Preservation Practice <http://www.clir.org/diglib/preserve/pracsharepv.htm>; Open Archives Initiative <http://www.openarchives.org/>
	Consortium of University and Research Libraries (CURL)	CEDARS Project (CURL Exemplars in Digital Archives) <http://www.leeds.ac.uk/cedars/>
	Cornell	Project PRISM (Preservation, Reliability, Interoperability, Security, and Metadata) <http://www.library.cornell.edu/preservation/prism.html>
	Michigan and Leeds	CAMiLEON (Creative Archiving at Michigan and Leeds: Emulating the Old on the New) Project. <http://www.si.umich.edu/CAMELION/about.htm>
	National Library of Australia	Preservation Metadata for Digital Collections. Exposure Draft, 2000 <http://www.nla.gov.au/preserve/pmeta.html>
	Networked European Deposit Library (NEDLIB)	Metadata for Long Term Preservation, 2000 <http://www.kb.nl/coop/nedlib/results/preservationmetadata.pdf>; An Experiment in Using Emulation to Preserve Digital Publications (Jeff Rothenberg, April 2000) <http://www.kb.nl/coop/nedlib/results/emulationpreservationreport.pdf>
	Stanford	LOCKSS (Lots of Copies Keep Stuff Safe) <http://lockss.stanford.edu/>
2.10 Toward Integrated Systems for Managing Electronic Resources		
	System Comparison Chart	Appendix B; includes output/functions and data elements
	Cornell	Web Hub for Developing Administrative Metadata for Electronic Resource Management. <http://www.library.cornell.edu/cts/elicensestudy/home.html>
	MIT	Brief descriptions and staff procedures for VERA are available at <http://macfadden.mit.edu:9500/webgroup/vera/index.html.>; for a full discussion, see Hennig, Nicole. 2001. Improving Access to E-journals and Databases at the MIT Libraries: Building a Database-backed Web Site Called "VERA." Available at <http://www.hennigweb.com/publications/vera.html>.
	Penn State	ERLIC software is available on a shareware basis at <http://www.libraries.psu.edu/iasweb/fiscal_data/ERLIC_SHARE/Publish/index.html>; A tour is also available at <http://www.libraries.psu.edu/iasweb/fiscal_data/ERLIC_SHARE/Publish/page2.html>

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2.10 Toward Integrated Systems for Managing Electronic Resources (contd.)	Texas	Rowe, Ronda. 2000. An interim solution for managing electronic resources at UT Austin. Presentation at Digital Library Federation Fall Forum, November 20. <http://www.diglib.org/forums/fall00/ramirez_files/frame.htm>

Appendix B: Functions and Data Elements for Managing Electronic Resources

For each of the systems analyzed, an "X" appears in the cell where a function or data element was identified. However, several of the systems interact with and support online acquisitions or cataloging systems, or systems for gateway page generation. Because of that, other codes, especially those for purchasing or financial functions and data elements, appear. For example, those libraries using their Innovative Interfaces acquisitions systems to manage online subscriptions show "III" where appropriate. Because the entries for Cornell are based on a planning document that identified functions and data elements as "Required," "Recommended," or "Optional" for a future system, those values were entered as indicated (Cornell 1999). Each of the profiled systems is complex; this highly schematic summary may tend to oversimplify or misrepresent them in some way.

Appendix B

	Paper System	Systems in Production								Systems in Planning or Development			
Institution	Nevada-Reno	Michigan	MIT	Notre Dame	Penn State	Simon Fraser	Texas	Virginia	Yale	Cornell	Stanford	UCLA	Washington
Contact	Patricia Loghry	Judy Wilhelm	Ellen Duranceau	Carole Richter	Betty Nimberger	Mark Jordan	Ronda Rowe	Paul Rittelmeyer	Kimberly Parker	Adam Chandler	Paul Zarins	Sharon Farb	Tim Jewell
Name of Project	Electronic Products Work Forms		VERA	New Web Titles	ERLIC	EJDB	Licemse Tracker	Electronic Resource License Information	E-Resources Masterfile	Metadata Initiative		Acquisitions database process	License Tracking
Online Acquisitions System/LMS		III			LIAS	III		SIRSI	NOTIS				III
Platform	paper system	License DB = Filemaker Pro	Filemaker	Filemaker Pro	MS Access	Perl, MySQL	LDAP	MS Access	ASP, NT SQL	na	Artesia/TEAM S and Oracle		Multimedia
URLs, etc.												x	
1. A. Listing and Descriptive Functions													
"Production" Database List(s)			x		x		x		In process				
Alpha		Mirlyn	x	x	x	x	x		In process		x		Dig. Reg (DR)
Subject		Mirlyn	x			x	x		In process		x		DR
Other		Mirlyn	x										DR
"Production" E-journal Lists							x	x	x				
Alpha		Mirlyn	x		x	x	x	x	x		x		
Subject		Mirlyn	x			x	x		In process		x		DR
Package/Publisher		Mirlyn	x				x	x	In process				DR
Full-text Title Lists, Including Aggregator Contents		Mirlyn			x	x		x	Part of "Production" E-journal List		x		
1. B. Descriptive/Bibliographic Data Elements													
Title	x	Mirlyn,LMS,L	x	x	x	x	x	x	x		x	x	LMS,L,DR
See Reference		Mirlyn	x	x	x				In process				LMS
Description (for users, staff)	x	Mirlyn	x	x	x	x	x	x	In process	Optional		x	LMS
Appending to												x	
Database Type or Genre	x		x	x	x			x	In process	Required	x	x	LMS,L
Monograph/Serial				x				x		Required		x	LMS
Full-text, Bibliographic, Numeric, etc.	x		x (if FT)	x						Required		x	
ARL Supp. Survey Stat. Type				x	x							x	
Order Number(s)	x	LMS	x	x	x						x	x	LMS
Catalog Record Number/Link		Mirlyn		x	x		some		In process		x	x	
Publisher	x	Mirlyn, LMS,L	x	x	x	MARC 110,710	x	x	x		x	x	LMS
Vendor	x	LMS,L	x	x	x	"source"	x	x	x		x	x	L
Hide			x						In process		x		LMS
Includes Full-text	x		x		x			x	x		x	x	LMS
Coverage/Edition(s)	x	Mirlyn,LMS	x		x			x		Consider		x	LMS
Completeness of Holdings	x									Consider		x	LMS
Update Frequency	x									Consider		x	L,LMS
Add to Subject Web Page	x			x							x		DR
Add to Category Web Page				x							x		DR

Key to codes
DR = Digital Registry (UW)
L = License database or file
LMS = Library Management System
P = Displayed to Public

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2. License-Related Data Elements and Display/Reporting Functions													
Licensed?	X	L	X	X	X	X	X	X			X	X	L,LMS
Date Signed	X	L		X	X		X		In process		X	X	L
Duration	X	L						X		Optional	X	X	L
License Terms (integrated into lists)		L						linked to each	linked to				
General Statement/Disclaimer			X,P									X	
Key License Terms/Highlights	X	L	X,P				X,P	X,P	X,P	Optional		X,P	
Usable for Interlibrary Loan?	X	L	X			X	X,P	X,P	X,P	Optional	X,P	X,P	L
E-reserves	X		X			X	X,P	X,P	X,P			X,P	L
Course-packs	X	L					X,P	link	X,P			X,P	L
Downloading	X	L	X,P				X,P	link	X,P	Optional		X,P	L
Copy		L						link	X,P			X,P	L
Print		L						link	X,P	Optional		X,P	
Limited Sharing/Scholarly Purposes								link	X,P	Optional		X,P	L
Walk-ins	X	L	X					link	X,P			X,P	L
Commercial Use		L				X			X,P			X,P	L
User Guidelines for Each Resource					X							X,P	L
Confidential?								X					
Special Terms	other	L	X,P	X					X			X	
Archival/Ongoing Access Rights (if any)		L						X				X	L
Link to PDF, Word Document, etc.?			X		X,P	X	X	X	X,P	Optional		X	L
Location of Paper License	X					central mgmt	X			Optional		X,P	
Active/Inactive		L,LMS					X	X				X	

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3. A. Financial Display and Reporting Functions													
Expenditures by Title	X	LMS	X		X				LMS		?	X	LMS
Expenditures by Fund		LMS	X		X				LMS		?		LMS
Expenditures by Location		LMS							LMS				
ARL Statistical Summary					X				LMS				
3. B. Financial/Purchasing Data Elements													
Selector(s)	X	LMS,L		X	X				X	Required		X	LMS
Negotiator	X	L		X				X		Required		X	L
Requester	X			X						Optional		X	
Pricing Information	X			X					LMS	Required		X	LMS,L
Discounts (consortial, time-based)		LMS		X					LMS	Required		X	LMS,L
Cost Components (content, print, electronic)	X	LMS		X					LMS	Required	X?	X	LMS,L
Print Subscription Requirement	X	L		X	X			?	In process	Required	X?	X	L
Funding (budgets involved, etc.)	X	LMS		X	X				LMS	Optional	Type?	X	LMS,L
Fund Code(s)	X	LMS		X	X				LMS	Optional			LMS,L
Gift?			X,P		X							X	
Endowment Fund(s)		LMS			X					Optional		X	
Payment History		LMS			X				LMS	Required	X	X	LMS
Duration of Purchase/Renew Date	X	LMS		X	X				LMS		X	X	L
Subscription or One-time		LMS		X	X				LMS			X	
Taxable?		exempt		X								X	
Supporting E-mails	X	paper copies		X	X					Consider		X	L
Basis for Decision (trial, flyer, etc.)										Consider		X	
Description/Evaluation Information for Staff										Consider		X	

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4. Process/Status Information and Tracking													
Action (Trial, Purchase, etc.)	x			x	x								LMS
Order Status	x	LMS		x	x	x			x		x	x	
Trial Information									In process				
Dates		Mirlyn					x		In process			x	
Local Trial Contacts, etc.							x		In process				
Comments from Trial													LMS
Trial/Under Consideration Pages		Mirlyn, O							x				
Signature Needed				x								x	LMS,L
Dates											x	x	L
Generic License Received											x		
Rejected									x			x	LMS
Signed				x					x		x	x	L,LMS
Mailed/Faxed													
Countersigned									x			x	
Last Contact												x	
Routing Notes (who has it?)				x	x		x			Optional		x	
Follow-up Notes					x								LMS
"Follow-up Needed" Reports				x	x		x						LMS
Post-signature "To Do" List													
Added to Licensing Web Page													
Descriptive Pages Done?													
Available Yet?								x	x		x	x	LMS
Decision (yes/no/reconsider?)	x									Consider	x	x	
Reason for Decision										Consider		x	
Future Product													
Upcoming Renewal Reports	x		x		x	x	x	x			x	x	L
Deselection Responsibility										Consider			
Preservation Plans/History										Consider			

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5. Systems/Technical/Access Information													
Platform	x				x	x	x				x	x	
Hardware Requirements	x				x	x			In process	Optional		x	
Software Requirements	x				x				In process	Optional		x	
URLs	x	Mirlyn		x	x		x		x		x	x	LMS,DR
Staff Access		Mirlyn	x		x	x			In process		x	x	L
Public Access		Mirlyn	x		x	x			x		x	x	L
Authentication				x	x		x		In process		x	x	L
IP Ranges Licensed	x (y or n)	L	x	x	x	x	x		In process	Req. or Opt.	x	x	L,DR
Username/Password(s)	x	L	x	x	x	x	x		In process	Optional	x	x	L
Proxy	x		x	x		x				Optional	x	x	L
Domain Name(s)		L			x		x					x	
Concurrent Users Allowed	changes in	L,LMS		x	x	x	x		x	Required	x	x	L
Access Limits		L,Mirlyn		x	x		x			Required			L
By IP			x										
By Location	x	L,Mirlyn	x		x	x	x			Required	x	x	L,LMS
By User Status	x	L,Mirlyn	x	x	x	x				Required		x	L
Remote Access Permitted	x	L			x	x	x			Required	x	x	L,DR,LMS
Interface			x										
Format	changes		x	x	x					Optional	x	x	L,LMS,DR
Availability/Problem Status		O	x		x	x		x	x		x	x	
Broken Resource			x								status?	x	
System Okay			x										L,DR
Problem Reports/History		O											
6. Contact and Support Information													
Vendor Technical Support Information		L	x	x	x	x	x	x	In process		x	x	L,LMS
Vendor Sales/Billing Information	URL	L,LMS	x	x	x	x	x	x	LMS	Optional	x	x	LMS
Local Coordinator/Contact		L	x	x	x	x	x	x	In process			x	
Support Information for Users (classes, help contact,			x		x	x		x	In process		x	x	
Documentation Available							x		In process			x	
7. Usage Information													
Data					x								
Description (where/how available, etc.)					x				x	Optional		x	
Reports		O	x		x				Link to				

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